DOCUMENT RESUME

ED 174 363 RC 011 192

| | |
|---|---|
| AUTHOR | Fairwell, Kay, Ed. |
| TITLE | The OBIS Story. Outdoor Biology Instructional Strategies. |
| INSTITUTION | California Univ., Berkeley. Lawrence Hall of Science. |
| SPONS AGENCY | National Science Foundation, Washington, D.C. |
| PUB DATE | 79 |
| GRANT | NSF-SED-72-05823 |
| NOTE | 24p. |
| AVAILABLE FROM | Outdoor Biology Instructional Strategies, Lawrence Hall of Science, University of California, Berkeley, California 94720 (free) |
| EDRS PRICE | MF01/PC01 Plus Postage. |
| DESCRIPTORS | *Activity Units; Biology; *Biology Instruction; Ecology; Educational Objectives; Elementary Secondary Education; *Environmental Education; *Experiential Learning; Field Instruction; Group Activities; Illustrations; *Instructional Materials; Learning Modules; Material Development; *Outdoor Education; Teaching Procedures; Youth Clubs; Youth Programs |
| IDENTIFIERS | *OBIS Program; Outdoor Biology Instructional Strategies |

ABSTRACT

Active participation in a variety of outdoor activities by small groups of youngsters aged 10 to 15 is the focus of the Outdoor Biology Instructional Strategies (OBIS) project, designed to provide the firsthand outdoor experience necessary for understanding biological relationships. OBIS provides community-sponsored youth organizations and schools with 100 learning activities for use at outdoor sites, such as lawns, playgrounds, city lots, and parks, common in a man-managed environment. The OBIS Trial Edition, developed and tested over 6 years, consists of 4 Sets of 24 varied activities and a Trail Module of 4 related activities, all emphasizing biological interactions and environmental interrelationships. Their short duration and easy-to-follow format, including notes on preparation, all necessary biological information, inexpensive or homemade equipment, and follow-up, make OBIS activities suitable for both experienced and inexperienced outdoor education leaders. Because each activity is based on a single principle, leaders need not follow a rigid sequence of activities to ensure concept comprehension, although several activities may be sequenced in a program to suit the leader's needs or for integrated study of a specific subject. All trial activities are listed and briefly explained. The OBIS system also includes a training primer, a Newsletter, and Resource Centers throughout the country. (SB)

**********
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
**********

# THE OBIS STORY

ED174363

RC 011192

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Dave Buller

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

# OUTDOOR BIOLOGY INSTRUCTIONAL STRATEGIES

Lawrence Hall of Science
University of California
Berkeley, California 94720

Editor: Kay Fairwell
Art Director: Lisa Haderlie Baker
Contributing Artists: Steve Agnew, Diane Dias

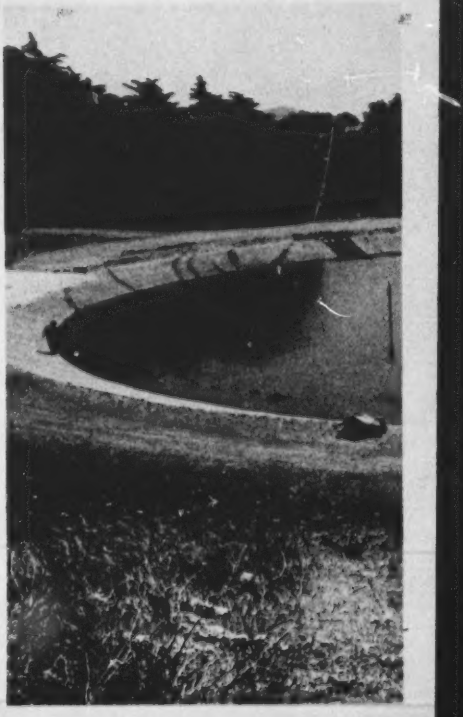
This material is based upon research supported by the National Science Foundation under Grant No. SED72-05823. Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the author and do not necessarily reflect the views of the National Science Foundation.

Copyright ©1979 by the Regents of the University of California

Are you looking for something different to engage your classroom students, a Scout Troop, a church-camp group, a 4-H club, a group of campers, or a group that is visiting your nature center? OBIS could be the answer.

## OBIS TAKES THE DISCOVERY APPROACH

Outdoor Biology Instructional Strategies (OBIS) is a program with a variety of outdoor activities for youngsters to enjoy. While engaged in these activities, youngsters also learn more about the environment in which they live. OBIS activities emphasize interactions of organisms with each other and with their environment. The activities are also concerned with interactions of people with their environment. In the OBIS activities, the learner is an active participant rather than a passive recipient of someone else's information. Games, simulations, craft activities, experiments, and analyses of data are examples of various strategies used.



## DURING CLASS AND AFTER SCHOOL

These activities are designed primarily for ten- to fifteen-year-old youngsters. However, both younger and older participants, including families, enjoy participating in OBIS activities. The activities are suitable for and are being used in outdoor school programs as well as by community groups.

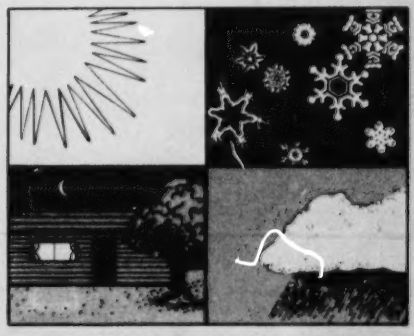
OBIS folios have an easy-to-follow format and are written for the teacher or leader. An OBIS leader is usually a teacher, Girl Scout leader, den mother, scoutmaster, camp counselor, volunteer, parent, student, or almost anyone who enjoys working with children.

## CHOOSE A SITE

OBIS activities can be used wherever you happen to find yourself: lawns, parks, school yards, backyards, street parkways, vacant lots, streams, rocky or sandy beaches. Some of the activities apply to any type of site, while others are designed for specific sites. Areas that support heavy human use are actually preferred to untouched, pristine environments.

## PICK YOUR TIME

When can you do OBIS activities? Some are suitable for night or day, rain or shine, winter or summer. Do them on a one-time basis, once a month, once a week, or every day for a week or two.



## LEARNING THROUGH PARTICIPATION

Why OBIS? OBIS wants to stimulate curiosity in the youngsters about life and the world around them. In order for youngsters to become aware of the environment in which they live, they need to participate in some thought-provoking activities. OBIS does not believe that children of this age group are satisfied with the "sniff and appreciate" approach to ecological understanding. Instead, OBIS encourages youngsters to investigate the interrelationships of plants, animals, and the physical environment, including the role of humans in the natural scheme. Youngsters not only develop observational skills that they can continue to use throughout their lives, but also gain some understanding about their environment.

In order for people to make intelligent decisions about their future environment, they must have knowledge of the one in which they live. Firsthand experience in the outdoors forms a basis for the understanding of biological relationships. This understanding is necessary to raise the public consciousness required to support appropriate management of the environment.

## THE "HOW TO . . ." OF OBIS

How can *you* lead an OBIS activity? The optimum size for a group is one leader and about twelve participants, but teachers who have good rapport with their students can easily work with a larger group. OBIS activities are easy to lead, easy to prepare, and require mostly simple or homemade equipment. No previous experience is necessary! Any biological information necessary to lead an activity is presented in the folio.

Each activity may be done independently, in a sequence, or as a lead-in to or culmination of other activities. Leaders decide how or whether they will sequence the activities. Most activities take a little less than an hour, but many are open-ended.

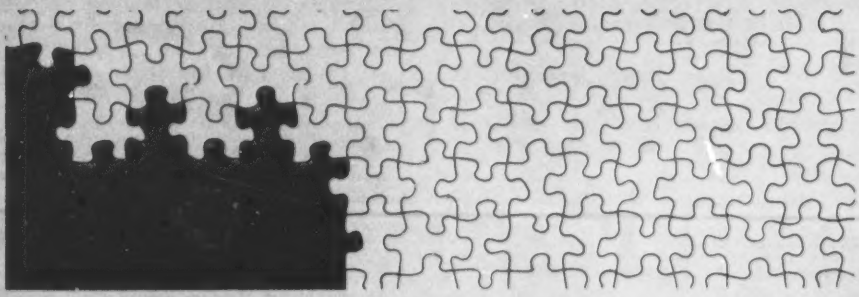
**How OBIS Activities are Developed**

How are these activities developed? Unlike many development projects, OBIS considers the testing of activities with youngsters to be a vital factor in the development of activities. The development process is one of devising a strategy, trying it out numerous times with youngsters, and making the necessary modifications. If the activity doesn't work with kids, it is not printed for trial use by other groups. Folios currently available are still in trial editions.

## THE BIOLOGY OF OBIS

Most of you have probably experienced the thrill of lifting up a log or an old board and discovering the myriad of organisms living underneath. Spiders, worms, sowbugs, crickets, salamanders, and fungi are some of the organisms that often form under-the-log communities. How are these organisms able to survive in this environment? What structural or behavioral adaptations enable them to exist under these special conditions? And what might this community under the log have to do with us? These are the kinds of biology questions you will find in OBIS activities. Along with such questions, OBIS provides investigative tools for the youngsters to use in finding possible answers.

The OBIS challenge is to help children understand some of the interactions between animals, plants, and the nonliving environment. To meet this challenge, OBIS uses the outdoor site as the laboratory in which youngsters have the opportunity to learn. We believe that youngsters gain more understanding by investigating biological events where they naturally occur — in the outdoors.

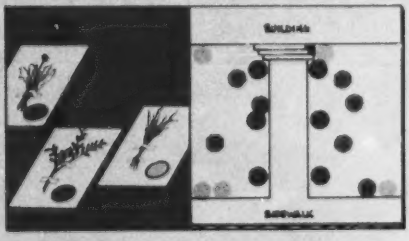


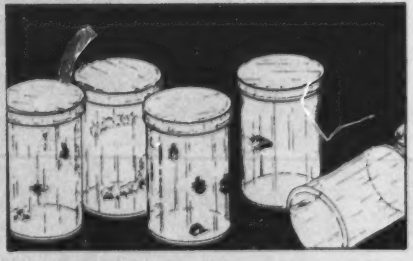
**Where Do We Fit In?**

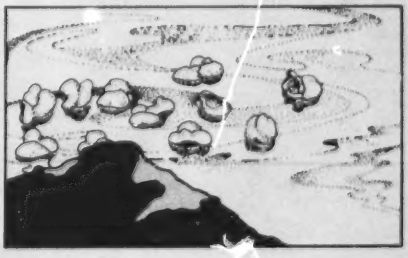
Our life on this earth is dependent on the life of other organisms. Directly or indirectly, other organisms provide us with food, clothing, and shelter. We eat other organisms and their products. Animal fur or hide and plant fibers are used for clothing. We convert plants into construction materials. In short, other organisms are essential to our daily life. In turn, our activities both directly and indirectly influence other organisms, whether they are the bacteria and micro-organisms in the soil, the algae and fish in our streams, or the trees in our forests.

OBIS brings these interrelationships home to the youngsters. In the OBIS activities *Plant Patterns*, *Animal Diversity*, *Junk-in-the-Box*, and *Can Fishing*, the youngsters look closely at the human influence in the distribution and kinds of organisms present in an area. In *OBIS Oil Spill* youngsters simulate effects of an offshore oil spill on plants, animals, and the human recreation potential of an

area. *The OBIS Trail Module* explores both the impact of a foot trail on a hillside area and the effect the steepness of the trail has on the people who use it. Youngsters directly interact with their environment in each OBIS activity. An important aspect of every OBIS experience is the opportunity for the youngsters to notice their own impact on the activity area.



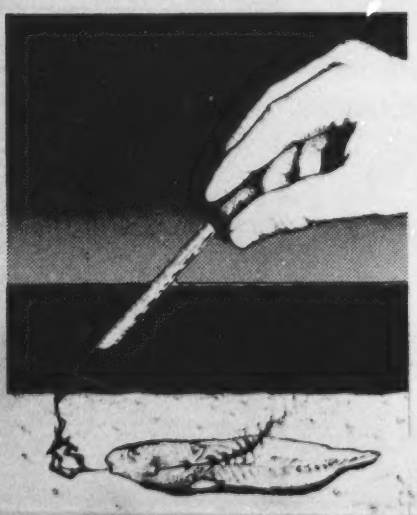




**Taking the Simple Approach**

OBIS activities are designed primarily for use in man-managed environments. These are the most common environments and are the ones with which the youngsters are most familiar. They can actively investigate such areas without causing irreparable damage to an environment. OBIS uses inexpensive or homemade equipment, which enables more leaders to use the materials, and more children to be exposed to outdoor biology. OBIS activity leaders usually have a limited background in outdoor biology. The leader's own sense of discovery in participating in the activity often enriches the youngsters' investigative enthusiasm.

OBIS activities, for the most part, are written to stand on their own. Thus it is not necessary to follow a rigid sequence of activities in order for the participants to understand a particular concept. Children can learn and understand a biological principle in just one activity — or they can do a series of activities for more extensive understanding. The leader has the choice.



**Simplifying Complexity**

Biology can be fascinating yet elegantly simple. Direct experiences, simulations, games, and creative art experiences are all part of OBIS strategies. Using diluted food coloring, children learn about animal respiration by actively searching for inlets and outlets of water breathers. True, the youngsters do not learn about complex reflexes of breathing. But, more importantly, they *see* food coloring emerging in squirts and steady streams, from "different places" than they expected: from the left sides of tadpoles, from the fronts of crayfish, and at different rates according to the animal or the

temperature. The biology of OBIS is a mixture of obvious and subtle experiences with local organisms and their great diversity of adaptations, both structural and behavioral. Adaptations result in survival and reproduction: the name of the game for all populations. In emphasizing both plant and animal adaptations that can be seen; touched, heard, or smelled by the youngsters, OBIS approaches the youngsters at their level. Once introduced at the youngsters' level, each principle may be enlarged upon by the leader and the children as far as their *experiences* will permit.

The OBIS approach is concrete because we found it had to be so. If the youngsters can't understand what they are doing, what value is there in proceeding?

The theme of OBIS revolves around ecosystems. Natural selection, successional changes, periodic changes in life forms, food chains and webs, species dominance and density, behavior of organisms, interactions of organisms with their environment, and population structure are the biological topics that we weave into the activities. The ecological theme provides the flexibility to help children of different ages, capabilities, interests, and backgrounds to learn biology in the outdoor settings where interactions take place.

## CURRENTLY AVAILABLE OBIS MATERIALS

Five different sets of OBIS activities are currently available: OBIS Trial Editions Set I, Set II, Set III, Set IV, and The OBIS Trail Module. These OBIS trial editions each contain activities for trial use. An OBIS activity is presented in an individual folio, which consists of one major high-interest activity. Each folio may be used as a one-day outdoor experience, or several folios may be linked together in a sequence to provide an integrated study of a specific habitat, biological concept, or investigative technique. Included in each folio is information regarding preparation, equipment, and follow up appropriate to the specific "action."

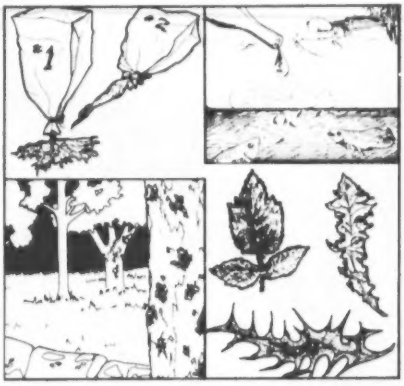
Included in Sets I, II, III, and IV, in addition to 24 activities, are three introductory folios: *What is OBIS?, Leader's Survival Kit,* and *OBIS Toolbox.* These three sets also include Action Cards, Equipment Cards, and Technique Cards for use with various activities.

### OBIS Trial Edition Set I

The first 24 folios make use of crafts, simulations, and basic investigative techniques. (See page 10.)

### OBIS Trial Edition Set II

The second 24 OBIS folios lean a little less toward crafts and more toward the use of living organisms such as lichens, grasshoppers, crabs, crayfish, insects, litter animals, and birds. (See page 11.)




### OBIS Trial Edition Set III

The third 24 OBIS folios deal predominantly with animal behavior, and with adaptations and diversity of both plants and animals. (See page 12.)

### OBIS Trial Edition Set IV

The fourth set of OBIS folios features simulations, crafts, biological techniques, and organism investigations for the forest, desert, and snow. (See page 13.)

### The OBIS Trail Module, Trial Version

This module provides a selection of four activities on a specific theme rather than the usual potpourri of investigations. The theme of this module is the evaluation of trail requirements and the impact trails have on people and the environment.

(See page 15.)

**OBIS Trial Edition Set I**

*Adaptation – Predator-Prey*
By creating and sharing predator devices, the children discover the variety of structures that animals use to capture food.

*Animal Movement in Water*
The students try to discover how aquatic animals move through water.

*Animals in a Grassland*
In this introductory activity, the participants use sweepnets to sample the variety of animals living in lawns.

*Attention!*
To explore visual communication, each youngster creates an eye-catching design intended to attract a specific member of the group.

*Bean Bugs*
In this simulation activity, the children learn how to census a population of organisms too numerous to count.

*Great Streamboat Race*
The participants enter cork boats in the Great Streamboat Race to discover the rate and direction of currents in a stream.

*Habitat Sun Prints*
Using a novel recording technique, the students "photograph" organisms and objects from different habitats.

*Habitats of the Pond*
In this activity, teams hunt for organisms in different areas of a pond or lake. The term *habitat* is introduced.

*How Many Organisms Live Here?*
Using homemade sampling gear, the youngsters estimate the numbers of organisms living in a small section of a pond.

*Invent an Animal*
The children design "animals" to blend into specific habitats, and then search for each others' camouflaged animals.

*Invent a Plant*
In this activity, the youngsters construct models of plants adapted for different environmental conditions.

*Mapping a Study Site*
Using a mapping technique, the youngsters familiarize themselves with the major features of their activity site.

*Moisture Makers*
The participants test different kinds of leaves with cobalt chloride paper. The paper's color changes allow the youngsters to compare the amounts of moisture released from different leaves.

*Natural Recycling in Soil*
The youngsters find out how different types of containers buried in the *soil* affect the decomposition of vegetation inside the containers.

*Natural Recycling in Water*
The students find out how different types of containers placed in the *water* affect the decomposition of vegetation inside the containers.

*Out of Control*
The youngsters release a portion of a lawn from human control and then observe the resulting changes over the next few months.

*Plant Hunt*
An exploratory hunt for plants familiarizes the participants with the diversity of plants in a selected site.

*Plants Around a Building*
By surveying the plants around a building, the children speculate on how the building affects plant growth.

*Seed Dispersal*
The students learn about seed dispersal by modifying beans and peas for dispersal by various natural and artificial forces.

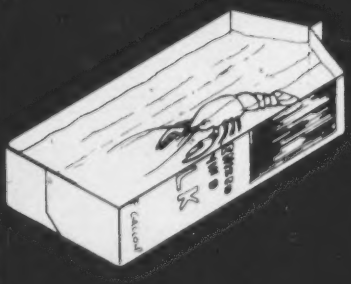
# WATER BREATHERS

TRIAL VERSION

When aquatic animals move underwater, they create a variety of currents. These include currents caused by swimming, feeding, and breathing. These currents are usually difficult to observe because of the lack of color contrast between currents and the surrounding water.

You can solve the "invisible current" problem by using diluted food coloring which safely passes through animals that actively pump water through their bodies. This technique provides enough color contrast to make animal currents visible.

INVESTIGATE CURRENTS THAT AQUATIC ANIMALS CREATE WHEN THEY BREATHE, FEED, AND PROPEL THEMSELVES THROUGH WATER



## MATERIALS

For each kid:

- 1 medicine dropper
- 4 dropperfuls of diluted food coloring (1 part food coloring to 8 parts water) in a small container (paper cup, film canister, etc.)
- 1 white-bottomed container (milk carton half, cut lengthwise)

Optional:

- 1 bug box (hand lens)

For the group:

- 1 large bucket of clear water (fresh or salt water, depending on source of your organisms)
- an assortment of aquatic animals
- 3-4 dipnets and spoons for transferring aquatic animals
- 2 small bottles of food coloring (blue, green, or red)

Available from the Lawrence Hall of Science. See the Equipment Order Form in the *OBIS Toolbox* folio.

If you cannot collect aquatic animals beforehand, you will need enough dipnets for your group to catch the animals at the beginning of the activity. Divide your activity period into two parts: a twenty-minute aquatic animal search and, with the nets put away, *Water Breathers*.

# WATER BREATHERS

TRIAL VERSION

## PREPARATION

1. Collect a variety of aquatic animals for the activity (fish, crayfish, tadpoles, shrimp, etc.). Also collect some plants and non-living objects from the aquatic animal's environment. If possible, collect enough aquatic animals to allow the participants to investigate more than one kind of animal. To keep your animals fresh and healthy, maintain uncrowded containers with lots of water. If you use jars, use wide-mouthed ones.
2. Dilute the food coloring before hand. Mix one part food coloring with eight parts water from the collection site. Mix up about 120 ml.

## ACTION

1. Tell the participants that many aquatic animals create a variety of water currents when they breathe, feed, and swim, and that these currents are usually difficult to observe. (Refer to cover information.)
2. Introduce the medicine dropper and diluted food coloring as tools for observing aquatic animal currents.
3. Place an active aquatic animal (fish, tadpole, shrimp, etc.) in a container filled with clear water and demonstrate the tracing technique. (See cover picture.) Emphasize the fact that only one carefully placed drop at a time is needed. Place the tip of the medicine dropper underwater and close to the area (mouth, tail, side, etc.) of the animal being investigated before squeezing the bulb.
4. Hand out the materials and let the kids choose an aquatic animal to investigate.
5. Challenge the group to use the medicine dropper technique to search for currents caused by breathing, feeding, and swimming movements of aquatic animals.
6. As they begin, stress the focus of the activity by challenging the kids to discover as much as they can about the currents their animals create, especially breathing currents.
7. Grab a medicine dropper and some "mystery" solution and investigate some currents yourself. Help refill the viewing containers with clear water when they need it. (Be careful not to lose the aquatic animals during refilling.) Some children do not administer the dye to any body part other than the head. Encourage the kids to apply the dye near other parts of the animal.
8. After about thirty minutes, challenge the participants to investigate their animals' reactions to other organisms and non-living objects taken from the same environment.
9. Encourage the kids to investigate several aquatic animals.

## CURRENT THOUGHTS

☐ Which animals seem to breathe water, i.e., pump water in and out of their bodies?

☐ Do any of the animals take in or expel water from areas other than their mouths? Which animals? Where do these intakes and exhausts occur?

☐ How do the animals circulate water?

☐ How might movement help an animal survive? (Food, oxygen, warmth, protection, etc.). Tell the kids that special features of an organism (such as gills for breathing or a powerful tail for fast swimming) that improve its chances of survival and reproduction are called **adaptations.**

☐ What adaptations would you need to live underwater? (Mechanical devices such as scuba are not allowed.)

## WHAT TO DO NEXT

| | Set |
|---|---|
| *Attract a Fish* | *II* |
| *Hopper Circus* | *II* |
| *A Better Fly Trap* | *II* |
| *Who Goes There?* | *I* |

**Outdoor Biology Instructional Strategies**
Lawrence Hall of Science
University of California
Berkeley California

Supported by a Grant from the National Science Foundation
Copyright © June 1975 by the Regents of the University of California

*Sticklers*
This simulation game introduces the youngsters to the concept of *distribution* by allowing them to identify the distribution patterns of "sticklers," imaginary animals.

*Terrestrial Hi-Lo Hunt*
Using simple equipment, the participants search for extremes of environmental variables such as temperature and light in a study site.

*Water Holes to Mini-Ponds*
The students observe and compare changes that take place in fertilized and unfertilized water holes.

*What Lives Here?*
In this introductory activity, the youngsters observe and identify plants and animals that live in an aquatic site.

*Who Goes There?*
In this nighttime activity, the kids use a portable flashlight and fluorescent bait to find evidence of animals active at night.

## OBIS Trial Edition Set II

*A Better Fly Trap*
The youngsters construct fly traps from milk cartons and investigate the behavior of flies.

*Animal Anti-Freeze*
In this activity, the students search for a hibernation site that will protect a make-believe animal from freezing.

*Animal Diversity*
Using sweep nets, the youngsters sample and compare the bugs living in two different areas: a managed lawn and a weedy area.

*Attract a Fish*
The youngsters explore the behavior of minnows by "fishing" with a variety of potential baits and lures.

*Beach Zonation*
The participants investigate the distribution of organisms in a rocky intertidal zone.

*Birdfeeder*
By experimenting with different types of birdfeeders, the students study the behavior and food preferences of birds.

*Crawdad Grab*
The youngsters explore crawdad behavior by building crawdad traps and "fishing."

*Flocking to Food*
The participants use a variety of "beaks" (trowels, spoons, sticks) to hunt for organisms that a bird might eat.

*Food Chain Game*
Taking the roles of hoppers, frogs, and hawks, the youngsters simulate a food chain and investigate feeding relationships.

*Gaming in the Outdoors*
By going on a modified scavenger hunt, participants increase their awareness of the variety in their environment.

*Hopper Circus*
Action Cards challenge the students to investigate the behaviors of hopping animals (beach hoppers, grasshoppers, frogs, and others).

*Lichen Looking*
The youngsters search for lichens and learn about their habitats, shapes, and colors.

*Litter Critters*
After searching for small animals living in the ground, the youngsters use their OBIS Litter Critter Wheels to "match" the catch.

*Metric Capers*
This activity uses an outdoor game format to introduce the metric system.

*OBIS Oil Spill*
Using popcorn to simulate an oil spill, the students estimate the "spill's" impact on the environment.

*Plant Patterns*
The youngsters investigate the distribution patterns and relationships of plants by mapping the location of plants in an area.

*Rock Pioneers*
After placing bare rocks in the intertidal zone, the youngsters keep track of the plants and animals that colonize the rocks over a period of weeks.

*Roots and Shoots*
The youngsters try to identify two "mystery plants" by digging up weeds and comparing their roots to those of the unidentified plants.

*Seas in Motion*
Using tennis balls, water balloons, and other simple devices, the participants investigate the movements and currents of the sea.

*Sensory Hi-Lo Hunt*
The students use *only* their senses to find the extremes of several environmental variables: wind, temperature, light, slope, and moisture.

*Sound Off!*
By using noisemakers to find "secret partners" before being "captured," the participants learn about one type of animal communication.

*The Old White Sheet Trick*
By attracting night-flying insects to a brightly lit surface and conducting other light-related experiments, the youngsters discover how light affects insects' behavior.

*Too Many Mosquitos*
The youngsters learn about biological control by finding predators that eat mosquito larvae.

*Water Breathers*
Using food coloring, the students investigate currents created by aquatic animals moving and breathing underwater.

## OBIS Trial Edition Set III

*Ants*
The youngsters use "super food" to investigate ant behavior.

*Beachcombing*
The beachcombers search for evidence of animal and plant life on a sandy beach and speculate on the origins of their finds.

*Can Fishing*
By going "can fishing" the students discover the kinds of aquatic organisms that live in and on submerged cans.

*Clam Hooping*
The participants conduct a population census of squirting clams on a beach or mudflat, and investigate the clams' natural history.

*Envirolopes*
Envirolope Challenges direct the youngsters to hunt for a variety of textures, colors, odors, and evidence of interactions in their activity site

*Fly a Leaf*
The participants "fly" and race leaves along lines to find out which ones catch more wind.

*Follow the Scent*
Using scent markers to delineate home territories, the youngsters discover one way animals use their sense of smell.

*For the Birds*
By feeding pigeons, ducks, or seagulls, the youngsters investigate bird behavior.

*Hold It*
After making a cork or sponge "creature" that can hold on against water current, the participants investigate the holding adaptations of real organisms.

*Isopods*
The youngsters explore the differences between sowbugs and pillbugs, and discover the relationship between structure and function.

*Jay Play*
After discovering the food-color preference of jays, the students try to change this preference by salting the food of that color.

*Junk-in-the-Box*
By investigating man-made litter, the youngsters discover which kinds of litter are used by animals for food or shelter. The youngsters are then asked to determine if litter has any value.

*Leapin' Lizards*
The youngsters use a special "lizard rig" to investigate lizard feeding behavior and interactions.

*Mystery Marauders*
After gathering evidence that plants in the site are being eaten, the youngsters try to identify the plant eaters.

*Night Shine*
The youngsters search for aquatic animals that are active at night, and then investigate the animals' responses to light.

*Pigment Puzzles*
The students use chromatography to explore leaf and flower colors, and to solve natural "pigment puzzles."

*Shake It!*
The youngsters try to find a community that matches a "mystery community" by shaking the animals out of different trees and shrubs.

*Silent Stalking*
By playing a nighttime game, the participants explore the importance of silent stalking skills to predators and the importance of sound detection to prey.

*Swell Homes*
The youngsters locate "swell homes" (galls) on plants and find out what lives in those homes.

*Variation Game*
By playing simple games, the youngsters investigate variations between individuals.

*Water Snails*
By marking, releasing, and later recapturing water snails, the youngsters discover the snails' preferred habitats.

*Water Striders*
The children explore the movement and feeding behavior of water striders.

*Web It*
With the aid of spray misters, straws, and sweep nets, the students investigate the behavior of spiders.

*Web Weavers*
The children use string art to reproduce the intricacies of different spider webs.

## OBIS Trial Edition Set IV

*Acorns*
By playing a survival game, the youngsters compare the winter food-storage strategies of squirrels.

*Bird Nests*
The students construct bird nests, place them in their site, and try to locate and identify each others' nests.

*Bugs, Worms, & Others*
The teams invent populations of make-believe organisms and then investigate real populations living in their activity site.

*Cactus Wheel*
With a simple hunt-and-walk technique, the youngsters determine the population densities of several desert plants.

*Cool It*
By taking advantage of the temperature variations in their site, the youngsters try to keep their "thermometer lizards" from overheating or getting too cold.

*Creepers and Climbers*
The participants investigate specialized climbing structures and growth patterns of different vines.

*Damsels and Dragons*
The students investigate damselfly and dragonfly perching behavior and discover how these "D-flies" react to flying decoys.

*Desert Hunt*
In this introduction to the desert, the teams design OBIS scavenger hunts for each other.

*Desert Water Keepers*
The youngsters experiment with paper leaf models to find out how different desert plants conserve water.

*Flower Powder*
The youngsters use artificial bees and paper models of flowers to find out how pollen can be moved from one flower to another.

*Helping Out*
In a simulated predator/prey game involving wolves and antelope, the participants find out how cooperation contributes to survival for certain animals.

*Hopper Herding*
The youngsters round up a "herd" of hopping insects (grasshoppers, crickets, and katydids, etc.) and find out how many different kinds are in their herd.

*Leaf Living*
The students hide and navigate in a kid-sized pile of leaves to experience the environment of animals that live in fallen leaves.

*Logs to Soil*
After cutting through and investigating rotten logs, the teams make log-profile puzzles for each other.

*Population Game*
In a feeding game, the youngsters find out how many deer can survive in a herd's "home range."

*Night Eyes*
Using flashlights, the participants locate and identify mysterious eyes in the night.

*Salt Water Revival*
During a low tide, the youngsters create an artificial high tide and observe its effects on marine animals.

*Sawing Away*
After sawing sections from fallen logs, the youngsters count tree rings and study the patterns of tree growth.

*Scent Tracking*
Using spray misters and liquid extracts to simulate prey scents, the kids play a game in which predators track a prey by following its scent.

*Scram or Freeze*
After being introduced to "scram" and "freeze" escape behaviors in a game, the kids investigate the escape behaviors of animals that live under logs and rocks.

*Snug as a Bug*
The youngsters make homes for imaginary insects, and then search for actual animals' constructions in and on leaves.

*Super Soil*
The students investigate the differences between a commercial garden soil and local soils.

*Tree Tally*
The youngsters use the OBIS transect to find the most common tree in a forest.

*Wintergreen*
The participants find green plants under the snow and determine the light and temperature conditions around those plants.

## The OBIS Trail Module, Trial Version

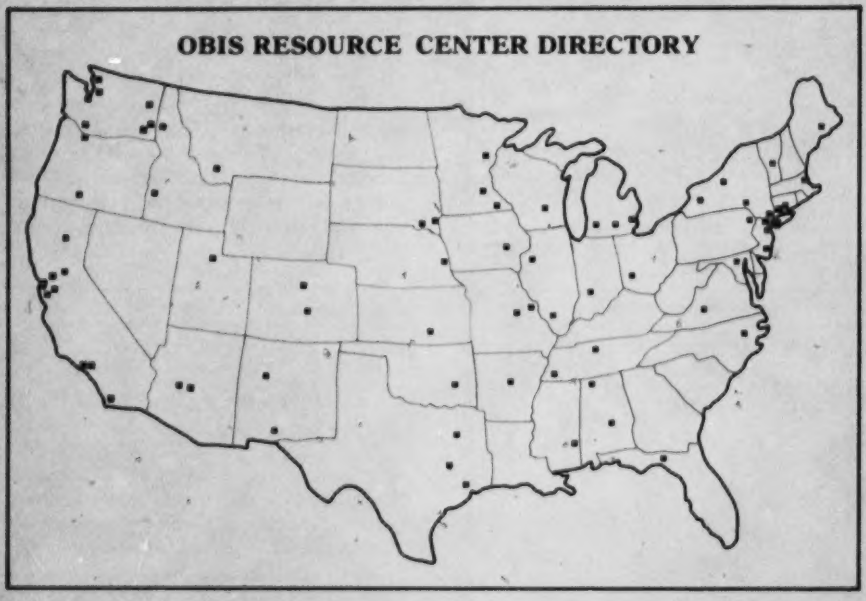
*Trail Impact Study*
Teams attempt to lay out the course of a foot path that will have the least amount of impact on the environment.

*Cardiac Hill*
Using heart rate as an indicator, the youngsters establish the maximum steepness for a foot path.

*Hold a Hill*
The students investigate the relationship between erosion and slope.

*Trail Construction*
Using their experiences from the previous activities as a guide, the youngsters select the best trail-construction technique for their site.

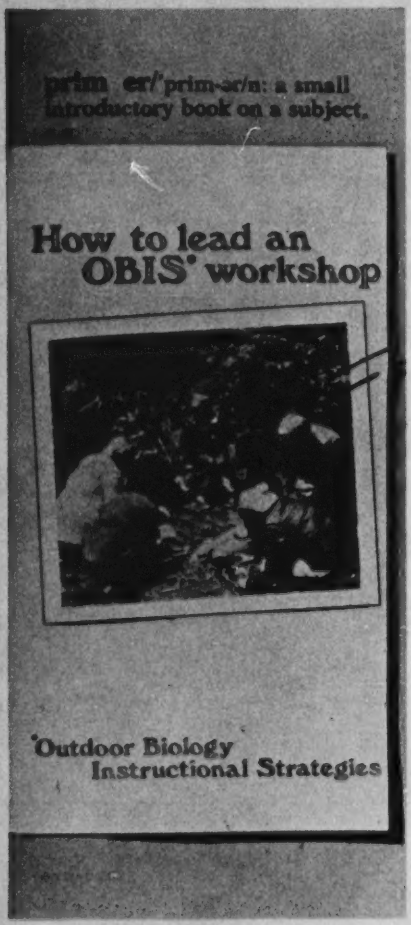
## OBIS RESOURCE CENTER DIRECTORY



This directory lists the centers across the country that offer information, advice, sample materials, and workshops. (See the OBIS Resource Center section for a more complete description of the center.)

## PRIMER: HOW TO LEAD AN OBIS WORKSHOP

The Primer outlines the planning necessary to conduct an OBIS workshop for training OBIS leaders. It offers guidelines on structuring a workshop, with consideration given to size of group, site, timing, different types of leaders, suggested activities, and follow up. As more people are trained to use OBIS, the subsequent increase in feedback will increase the quality of future revisions of the activities.


prim er/'prim-ər/n: a small introductory book on a subject.
How to lead an OBIS® workshop
®Outdoor Biology Instructional Strategies

## OBIS NEWSLETTER

The OBIS Newsletter reports on the progress of OBIS. The newsletter contains announcements of new activities, descriptions of innovative uses of OBIS and different types of groups using OBIS activities. The newsletter will provide you with an update on all OBIS events, so let us add your name to the mailing list.

## FEEDBACK

All OBIS activities are in trial version. We depend on the people who use OBIS materials to give us feedback on these activities. We are particularly interested in any adaptations you have to make for your particular environment or group of participants. Improvements, criticisms, and new approaches provide the basis both for revision of existing activities and for development of new activities.

## OBIS RESOURCE CENTERS

During the years that OBIS materials have been available, the number of requests for information, materials, and workshops has steadily increased. In an attempt to answer all these requests and to gather feedback from OBIS users, we have established OBIS Resource Centers throughout the country.

The director of each center is a person who has workshop experience with either the OBIS staff biologists or the former OBIS Field Centers. These people are well versed in the OBIS philosophy, method of training, and materials. Because OBIS is not able to contribute funds to these centers and must rely on the dedication of the directors, the type of services available will vary from center to center. Each center will provide general information and display copies of the latest OBIS materials and brochures.

Most centers will offer at least one workshop a year, and some centers will be able to offer as many workshops as are requested by community or school groups. Because the directors are volunteers, many of them will have to charge workshop fees in order to recover their expenses.

To obtain the services of a Resource Center, call or write the director nearest you and request whatever arrangements you or your group would like. (The *OBIS Resource Center Directory* is available at no charge from OBIS Headquarters.)

## COMMERCIAL PUBLICATION OF OBIS!

Delta Education has been selected as the exclusive publisher of OBIS materials. Delta plans to release the first module of revised OBIS activities in June of 1979 and to have all the revised activities available by December of 1980.

The current trial versions of the activities will be revised on the basis of feedback suggestions from thousands of OBIS users. Feedback suggestions are responsible for Delta's plans to offer activities individually and in modules. Interested OBIS users will now be able to purchase activities one at a time or in modules of four to eight activities that focus on particular environments such as the school yard, backyard, field, beach, and pond. In addition, Delta is planning to offer a complete stock of OBIS equipment.

Starting in June of 1979, contact Delta Education, Box M, Nashua, New Hampshire 03061 for information, newsletters, and order forms for the revised OBIS materials.